

INTERNATIONAL ENVIRONMENTAL LAW AND EMOTIONAL RATIONAL CHOICE

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ABSTRACT

This paper considers how emotions can foster compliance by rational actors with international environmental law. Many environmental issues are highly emotionally charged. Both supporters and opponents of international environmental law often feel very strongly about their positions and views. A psychological game-theoretic model focuses on the disciplinary role that losing face may play in compliance with international environmental law. This model implies that noncompliance, especially by high-profile international actors, should be highly and swiftly publicized on detection and verification. The model also explains why actors care so much about soft, that is, nonbinding international environmental law, such as international environmental declarations, protocols, or resolutions.

I. INTRODUCTION

INTERNATIONAL environmental law developed in this century in response to a growing recognition that many environmental issues cross national boundaries and legal systems. Examples include acid rain,¹ biological diversity loss,² common resources,³ endangered habitats and species protection,⁴

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¹ John McCormick, *Acid Earth: The Global Threat of Acid Pollution* (1985).

² Christopher D. Stone, *Land Use and Biodiversity*, 27 *Ecology L. Q.* 967 (2001).

³ Elinor Ostrom: *Governing the Commons: The Evolution of Institutions for Collective Action* (1990).

⁴ John B. Heppes & Eric J. McFadden, *The Convention on International Trade in Endangered Species of Wild Fauna and Flora: Improving the Prospects for Preserving Our Biological Heritage*, 5 *B.U. Int’l L. J.* 229 (1987).

environmental disasters,⁵ global climate change,⁶ global environmental markets,⁷ hazardous waste management,⁸ military activities,⁹ ozone depletion,¹⁰ and sustainable development.¹¹ As with international law generally, international environmental law is based on general principles, customs, treaties, and judicial decisions.¹²

The field of modern international environmental law has its origins in a dispute between the United States and Canada over air pollution damages in Washington State from an ore smelter in Trail, British Columbia.¹³ The resolution of this dispute established the norm of customary international law that it is the state's duty to avoid letting its activities produce harm in other states. Failing that duty, a state is liable to compensate for environmental damages. International environmental law in the 1950s and 1960s proceeded almost exclusively in the form of such customary laws. In the 1970s, treaties began to codify the customary norms of international environmental law. The 1980s and 1990s witnessed a proliferation in the magnitude, complexity, and scope of international environmental law treaties. No longer content to merely codify existing norms, these new treaties imposed new duties and standards on states and other actors.

In addition to such hard international environmental law, which is legally binding, there is also soft international environmental law, which is not legally binding. Examples of soft international environmental law include declarations adopted by international conferences¹⁴ or resolutions of international organizations.¹⁵ Frequently, soft international environmental law is expressed in terms of aspirations, goals, hortatory rhetoric, or vague guidelines. The moral and ethical language of much of soft international environmental law

⁵ Edith Brown Weiss, *Environmental Disasters in International Law*, 1986 *Anuario Juridico Interamericano* 141 (1988).

⁶ Graciela Chichilnisky & Geoffrey Heal, *Global Environmental Risks*, 7 *J. Econ. Persp.* 65 (1993).

⁷ *Environmental Markets: Equity and Efficiency* (Graciela Chichilnisky & Geoffrey Heal eds. 2000).

⁸ Theo Colburn, John Peterson Myers, & Dianne Dumanoski, *Our Stolen Future* (1996).

⁹ Michael N. Schmitt, *Green War: An Assessment of the Environmental Law of International Armed Conflict*, 22 *Yale J. Int'l L.* 1 (1997).

¹⁰ Edward A. Parson, *Protecting the Ozone Layer*, in *Institutions for the Earth: Sources of Effective International Environmental Protection* 27 (Peter M. Haas, Robert O. Keohane, & Marc A. Levy eds. 1993).

¹¹ *Sustainable Development and International Law* (Winfriede Lang ed. 1995).

¹² *Stat. I.C.J.*, art. 38, ¶ 1.

¹³ *Trail Smelter Arbitration (United States v. Can.)*, 3 *R.I.A.A.* 1905 (1941), reprinted in 35 *Am. J. Int'l L.* 684 (1941).

¹⁴ For example, the 1972 Stockholm Conference on the Human Environment or the 1992 U.N. Rio Conference on Environment and Development.

¹⁵ For example, the World Charter for Nature promulgated by the U.N. General Assembly.

means that it might play the role of a noisy signal or cheap talk.¹⁶ But international actors, especially states, habitually comply with soft international environmental law. Such compliance may “be due to a mere expectation of compliance expressed by other states and by the general public (including their own citizens) with respect to precepts that a government has helped to negotiate and include in an instrument adopted with the concurrence of its representatives in an international organ.”¹⁷

The question of why actors comply with international law applies not only to soft international law but also to hard international law. In fact, most states voluntarily comply with most international law most of the time.¹⁸ Self-help in the form of unilateral economic sanctions is limited by the World Trade Organization overseeing complex quasi-judicial proceedings that determine appropriate retaliatory actions.¹⁹ Using or threatening military force is prohibited except for self-defense in the face of an armed attack.²⁰ Collective sanctions are problematic not only because of free-rider possibilities but also because of political and procedural difficulties.²¹ There is no hierarchical judicial system whereby higher courts bind lower ones regarding international environmental law. In particular, there is no doctrine of *stare decisis* for decisions by the World Court.²² Finally, one can argue that scientific uncertainty about long-term effects of international environmental risks justifies postponing compliance.²³

Empirical studies on compliance with international law, especially international environmental law, document compliance levels and examine which variables, such as the availability of sanctions or whether a particular law is binding, affect compliance levels.²⁴ Theoretical explanations of com-

¹⁶ Jack L. Goldsmith & Eric A. Posner, *Moral and Legal Rhetoric in International Relations: A Rational Choice Perspective*, in this issue, at S115.

¹⁷ Edith Brown Weiss *et al.*, *International Environmental Law and Policy* 190 (1998).

¹⁸ Louis Henkin, *How Nations Behave: Law and Foreign Policy* 47 (2d ed. 1979).

¹⁹ Warren F. Schwartz & Alan O. Sykes, *The Economic Structure of Renegotiation and Dispute Resolution in the World Trade Organization*, in this issue, at S179.

²⁰ U.N. Charter, art. 2, ¶ 4, and art. 51.

²¹ Paul C. Szasz, *Sanctions and International Nuclear Controls*, 10 *Conn. L. Rev.* 545 (1979).

²² *Stat. I.C.J.*, art. 59.

²³ Alistair Ulph & David Ulph, *Global Warming, Irreversibility and Learning*, 107 *Econ. J.* 636 (1997). But see Christian Gollier *et al.*, *Scientific Progress and Irreversibility: An Economic Interpretation of the “Precautionary Principle,”* 75 *J. Pub. Econ.* 229 (2000). See generally *The Precautionary Principle and International Law: The Challenge of Implementation* (David Freestone & Ellen Hey eds. 1996). For a critique of the paralyzing nature of the precautionary principle and a behavioral economics accounting of the precautionary principle, see Cass R. Sunstein, *Beyond the Precautionary Principle* (unpublished manuscript on file with author, Univ. Chicago, March 2002).

²⁴ Abram Chayes & Antonia Handler Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (1995); George W. Downs, David M. Rocke, & Peter N. Barsoom, *Is Good News about Compliance Good News for Cooperation?* 50 *Int'l Org.* 379 (1996); *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice* (David G. Victor, Kal Raustiala, & Eugene B. Skolnikoff eds. 1998).

pliance with international law generally include repeated asymmetric information game-theoretic models that are based on concerns with explicit sanctions,²⁵ actors' reputations,²⁶ or the presence of shared conjectures.²⁷ This paper suggests a complementary theoretical explanation for compliance with law generally and compliance with international environmental law particularly that is based on a psychological game-theoretic model of the "discipline of shame."²⁸ This model extends unemotional rational choice theory by considering actors that are in part motivated by a desire to avoid losing face in the international community. While the model applies to legal compliance generally, the international community is a more focused and enduring audience than any society at large is for individuals. Disputes over international environmental issues usually have greater emotional salience than other international disputes, such as those in securities or tax, because many people feel that global environmental problems implicate the future of the species and involve moral and ethical choices about how to live in harmony with the planet. For example, in the public service announcement "One Percent Can Make All the Difference in the World," actor and member of the board of Conservation International, Harrison Ford, compares the Earth's most vital biological regions to the human heart and explains the importance of biodiversity conservation to a healthy planet.²⁹

The rest of this paper is organized as follows. Section II briefly discusses alternative formulations of emotions in rational choice theory and in law. Section III presents a model of emotional preferences to explain how and why not wanting to lose face on the part of states or more precisely their governmental actors and leaders can induce compliance with international environmental law. This model has novel policy implications for monitoring versus enforcement versus publicity. Section IV briefly discusses extensions of the basic model that include heterogeneous preferences and malleable preferences over time. A brief conclusion summarizes the key points in this emotional rational choice approach to international environmental law and considers other approaches to emotions and choice.

²⁵ Andrew T. Guzman, *International Law: A Compliance Based Theory*, 90 *Cal. L. Rev.* (2002).

²⁶ George W. Downs & Michael A. Jones, *Reputation, Compliance, and International Law*, in this issue, at S95.

²⁷ James D. Morrow, *The Laws of War, Common Conjectures, and Legal Systems in International Politics*, in this issue, at S41.

²⁸ Weiss *et al.*, *supra* note 17, at 223.

²⁹ See <http://www.conservation.org/xp/CIWEB/newsroom/psa>.

II. RATIONAL CHOICE AND EMOTIONS

A. *Rational Choice*

Rational choice theory is defined by its two central assumptions, namely, methodological individualism and purposeful action.³⁰ The first assumption means that individual decision makers determine, via their interaction, social outcomes. The second assumption means that individual decision makers are rational in the sense of seeking to maximize a complete and transitive preference ordering over outcomes. Rational choice theory is agnostic over what affects an individual decision maker's preferences. Particular preferences can be "selfish, altruistic, loyal, spiteful, or masochistic."³¹ Microeconomic theorists originally formulated and developed rational choice models to mathematically analyze the pure theory of individual consumer behavior. Generalizing to decision making over time and in the face of risk led to a theory of investor behavior that is the cornerstone of modern finance.³² But rational choice theorists have applied this approach to numerous apparently non-economic or nonmarket settings.³³

Political science has been an active area for the application of rational choice theory.³⁴ There are now several recent expositions that are accessible to undergraduates about how to apply rational choice theory to analyze American politics,³⁵ congressional politics,³⁶ political science,³⁷ and public policy.³⁸ The same is true for comparative politics.³⁹ There are rational choice models of the antinuclear movement;⁴⁰ the civil rights movement;⁴¹ multiparty

³⁰ Gideon Doron & Itai Sened, *Political Bargaining: Theory, Practice & Process* 19–23 (2001).

³¹ Gary S. Becker, *The Economic Way of Looking at Life* (Nobel lecture, December 9, 1992).

³² Christian Gollier, *The Economics of Risk and Time* (2001). But see *Advances in Behavioral Finance* (Richard H. Thaler ed. 1993); Hugh Schwartz, *Rationality Gone Awry? Decision Making Inconsistent with Economic and Financial Theory* (1998); Richard H. Thaler, *Quasi Rational Economics* (1991).

³³ Jack Hirshleifer, *The Expanding Domain of Economics*, 75 *Am. Econ. Rev.* 53 (1985); Edward P. Lazear, *Economic Imperialism*, 115 *Q. J. Econ.* 99 (2000). But see Peter C. Ordeshook, *The Emerging Discipline of Political Economy*, in *Perspectives on Positive Political Economy* 9 (James E. Alt & Kenneth A. Shepsle eds. 1990).

³⁴ Gary J. Miller, *The Impact of Economics on Contemporary Political Science*, 35 *J. Econ. Literature* 1173 (1997).

³⁵ William T. Bianco, *American Politics: Strategy and Choice* (2001).

³⁶ Charles Stewart III, *Analyzing Congress* (2001).

³⁷ Kenneth A. Shepsle & Mark S. Bonchek, *Analyzing Politics: Rationality, Behavior, and Institutions* (1997).

³⁸ Michael C. Munger, *Analyzing Policy: Choices, Conflicts, and Practices* (2000).

³⁹ *Comparative Politics: Rationality, Culture, and Structure* (Mark Irving Lichbach & Alan S. Zuckerman eds. 1997).

⁴⁰ Karl-Dieter Opp, *Soft Incentives and Collective Action: Participation in the Anti-nuclear Movement*, 16 *Brit. J. Pol. Sci.* 87 (1986).

⁴¹ Dennis Chong, *Collective Action and the Civil Rights Movement* (1991).

electoral competition;⁴² bureaucratic, electoral, and legislative politics;⁴³ political economics;⁴⁴ political protest;⁴⁵ revolution;⁴⁶ and value conflicts.⁴⁷ There is a fascinating collection of commentaries by political scientists on the influence seven Nobel laureates in economics have had on political science that includes reactions to those commentaries by the Nobel laureates.⁴⁸ But debates over the utility of rational choice theory in political science persist.⁴⁹ Some challenges to rational choice theory involve general considerations of bounded or intended rationality.⁵⁰ Other challenges involve specific alternatives to expected utility theory, such as prospect theory⁵¹ and reason-based choice.⁵²

A particular type of rational choice theory, namely, game theory, has found many applications in political science.⁵³ Many of these applications are in the field of international relations.⁵⁴ Applying game theory in an international context raises the question of just who the players are in such games because there are well-known problems with assuming that nondictatorial states or other nongovernmental organizations (NGOs) possess well-defined prefer-

⁴² Kenneth A. Shepsle, *Models of Multiparty Electoral Competition* (1991).

⁴³ Randall L. Calvert, *Models of Imperfect Information in Politics* (1986).

⁴⁴ Torsten Persson & Guido Tabellini, *Political Economics: Explaining Economic Policy* (2000).

⁴⁵ Karl-Dieter Opp, *The Rationality of Political Protest: A Comparative Analysis of Rational Choice Theory* (1989).

⁴⁶ Karl-Dieter Opp, Peter Voss, & Christiane Gern, *Origins of a Spontaneous Revolution: East Germany, 1989* (1995).

⁴⁷ Dennis Chong, *Rational Lives: Norms and Values in Politics and Society* (2000).

⁴⁸ *Competition and Cooperation: Conversations with Nobelists about Economics and Political Science* (James E. Alt, Margaret Levi, & Elinor Ostrom eds. 1999).

⁴⁹ Andre Blais, *To Vote or Not to Vote? The Merits and Limits of Rational Choice Theory* (2000); Gary W. Cox, *The Empirical Content of Rational Choice Theory: A Reply to Green and Shapiro*, 11 *J. Theoretical Pol.* 147 (1999); Karl-Dieter Opp, *Contending Conceptions of the Theory of Rational Action*, 11 *J. Theoretical Pol.* 171 (1999); *Political Science as Puzzle Solving* (Bernard Grofman ed. 2001); *Rational Choice and Security Studies: Stephen Walt and His Critics* (Michael E. Brown *et al.* eds. 2000); Sidney Verba, Kay L. Schlozman, & Henry E. Brady, *Rational Action and Political Activity*, 12 *J. Theoretical Pol.* 243 (2000).

⁵⁰ Bryan D. Jones, *Politics and the Architecture of Choice* (2001).

⁵¹ *Avoiding Losses/Taking Risks: Prospect Theory and International Conflict* (Barbara Farnham ed. 1994); Rose McDermott, *Risk-Taking in International Politics: Prospect Theory in American Foreign Policy* (1998).

⁵² Rose McDermott, *The Psychological Ideas of Amos Tversky and Their Relevance for Political Science*, 13 *J. Theoretical Pol.* 5 (2001).

⁵³ James D. Morrow, *Game Theory for Political Scientists* (1994); Scott Gates & Brian D. Humes, *Games, Information, and Politics: Applying Game-Theoretic Models to Political Science* (1997).

⁵⁴ Bruce Bueno de Mesquita, *Principles of International Politics: People's Power, Preferences, and Perceptions* (2000); Morrow, *supra* note 53, at 258–59; Arthur A. Stein, *Why Nations Cooperate: Circumstance and Choice in International Relations* (1990).

ences.⁵⁵ One response is that game-theoretic models analyze such actors as if they had transitive preferences, even though it is known they cannot or do not have such preferences. A second response is that while neither states nor NGOs can or do have such preferences, individuals within states or NGOs do and can have such preferences, whether these individuals are organizational leaders, citizens, consumers, managers, regulators, or shareholders.

There has also been a proliferation of game-theoretic models analyzing legal rules and institutions.⁵⁶ An often-made criticism of game theory is that “[f]actors such as the personal characteristics of the decision-makers or social values prevailing in their community, which may affect the decision-makers’ choices, are exogenous to game theoretical analysis.”⁵⁷ This paper addresses this criticism, which is related to behavioral criticisms of rational choice theory that find support from insights of cognitive and social psychology.⁵⁸

B. Emotions

One criticism of some rational choice theory is that, “[w]ith all its cleverness, decision theory is somewhat crippled emotionally, and thus detached from the emotional and visceral richness of life.”⁵⁹ In fact, there is renewed interest about emotions in general.⁶⁰ But the economist Adam Smith wrote

⁵⁵ Kenneth J. Arrow, *Social Choice and Individual Values* (2d ed. 1963); David Austen-Smith & Jeffrey S. Banks, *Positive Political Theory I: Collective Preference* 26–38 (1999).

⁵⁶ Ian Ayres, *Playing Games with the Law*, 42 *Stan. L. Rev.* 1291 (1990) (reviewing Eric Rasmusen, *Games and Information: An Introduction to Game Theory* (1989)); Douglas G. Baird *et al.*, *Game Theory and the Law* (1994); Peter H. Huang, *Strategic Behavior and the Law: A Guide for Legal Scholars to Game Theory and the Law and Other Game Theory Texts*, 36 *Jurimetrics J. L. Sci. & Tech.* 99 (1995); Eric Talley, *Interdisciplinary Gap Filling: Game Theory and the Law*, 22 *L. & Soc. Inquiry* 1055 (1997).

⁵⁷ Moshe Hirsch, *Game Theory, International Law, and Future Environmental Cooperation in the Middle East*, 27 *Denv. J. Int’l L. & Pol’y* 75, 118 (1998).

⁵⁸ Christine Jolls, Cass R. Sunstein, & Richard H. Thaler, *A Behavioral Approach to Law and Economics*, 50 *Stan. L. Rev.* 1471 (1998); *Behavioral Law & Economics* (Cass R. Sunstein ed. 2000); But see Jennifer Arlen, *Comment: The Future of Behavioral Economic Analysis of Law*, 51 *Vand. L. Rev.* 1765 (1998); Daniel A. Farber, *Toward a New Legal Realism*, 68 *U. Chi. L. Rev.* 279 (2001) (reviewing Sunstein ed., *supra*); Tanina Rostain, *Educating Homo Economicus: Cautionary Notes on the New Behavioral Law and Economics Movement*, 34 *L. & Soc. Rev.* 973 (2000).

⁵⁹ George Loewenstein, *Out of Control: Visceral Influences on Behavior*, 65 *Org. Behav. & Hum. Decision Processes* 272, 289 (1996).

⁶⁰ Aaron Ben-Ze’ev, *The Subtlety of Emotions* (2000); Randolph R. Cornelius, *The Science of Emotion: Research and Tradition in the Psychology of Emotion* (1996); Jon Elster, *Strong Alchemies of the Mind: Rationality and the Emotions* (1999); Jon Elster, *Strong Feelings: Emotion, Addiction, and Human Behavior* (1999); Peter Goldie, *The Emotions: A Philosophical Exploration* (2000); Paul E. Griffiths, *What Emotions Really Are: The Problem of Psychological Categories* (1997); Jack Katz, *How Emotions Work* (1999); *Cognition and Emotion* (Eric Eich *et al.* eds. 2000); *Emotion, Development, and Self-Organization: Dynamic Systems Approaches to Emotional Development* (Marc D. Lewis & Isabela Granic eds. 2000); *Emotions: Current Issues and Future Directions* (Tracy J. Mayne & George A. Bonanno eds. 2001); *Handbook of Emotions* (Michael Lewis & Jeannette M. Haviland-Jones eds., 2d ed. 2000); *The Nature of Emotion: Fundamental Questions* (Paul Ekman & Richard J. Davidson eds. 1994).

a book about empathy and sympathy, *The Theory of Moral Sentiments*, before he wrote his more well known book, *An Inquiry into the Nature and Causes in the Wealth of Nations*.⁶¹ More recently, two economists have argued that emotions can solve commitment problems and possess evolutionary value.⁶² Other economists have stressed how emotions can interfere with rationality.⁶³ Lately, legal academics, literature scholars, and philosophers are reconsidering the appropriate role of emotions in law.⁶⁴ An emotional perspective to international relations sheds light on a concept often employed in that field, namely, that of collective identity.⁶⁵

A commonly held view is that emotions are opposed to rationality. René Descartes envisioned such a rigid separation or dualism between body and mind.⁶⁶ This alleged dichotomy between feelings and reasons has a long history in Western culture, dating back to Socrates and Plato.⁶⁷ Aristotle stated that “[l]aw . . . may . . . be defined as ‘Reason free from all passion.’”⁶⁸ A recent popular movie involving legal education featured that quotation written on the blackboard at the first meeting of a fictional class at Harvard Law School.⁶⁹ The notion that emotions cloud one’s judgment is also prevalent in science fiction.⁷⁰ The half-Vulcan, half-human character from the *Star Trek* television series and movies, Spock, has difficulty reconciling logical reasoning and emotional feelings.⁷¹ The same is true of a

⁶¹ Adam Smith, *The Theory of Moral Sentiments* (Prometheus Books 2000) (1759); Adam Smith, *The Wealth of Nations: An Inquiry* (Modern Library 1994) (1776).

⁶² Robert H. Frank, *Passions within Reason: The Strategic Role of the Emotions* (1988); Jack Hirshleifer, *On the Emotions as Guarantors of Threats and Promises*, in *The Latest on the Best: Essays on Evolution and Optimality* 307 (John Dupre ed. 1987).

⁶³ Bruce E. Kaufman, *Emotional Arousal as a Source of Bounded Rationality*, 38 *J. Econ. Behav. & Org.* 135 (1999); Loewenstein, *supra* note 59; George Loewenstein, *Emotions in Economic Theory and Economic Behavior*, 90 *Am. Econ. Rev.* 426 (2000); Paul M. Romer, *Thinking and Feeling*, 90 *Am. Econ. Rev.* 439 (2000).

⁶⁴ Susan Bandes, *The Passions of Law* (1999); Sarah Boxer, *When Emotion Worms Its Way into Law*, *N.Y. Times*, April 7, 2001, at B7; Lynne N. Henderson, *Legality and Empathy*, 85 *Mich. L. Rev.* 1574 (1987); Owen D. Jones, *Law, Emotions, and Behavioral Biology*, 39 *Jurimetrics J.* 283 (1999); Dan M. Kahan & Martha C. Nussbaum, *Two Conceptions of Emotion in Criminal Law*, 96 *Colum. L. Rev.* 269 (1996); Eric A. Posner, *Law and the Emotions*, 89 *Geo. L. J.* 1977 (2001); Richard A. Posner, *Frontiers of Legal Theory* 225–51 (2001); Symposium: *Law, Psychology, and the Emotions*, 74 *Chi.-Kent L. Rev.* 1423 (2000); D. Don Welch, *Ruling with the Heart: Emotion-Based Public Policy*, 6 *S. Cal. Interdisciplinary L. J.* 55 (1997).

⁶⁵ Tadashi Anno, *Collective Identity as an “Emotional Investment Portfolio,”* in *Beyond Boundaries? Disciplines, Paradigms, and Theoretical Integration in International Studies* 117 (Rudra Sil & Eileen M. Doherty eds. 2000).

⁶⁶ 1 René Descartes, *The Philosophical Writings of Descartes: The Passions of the Soul* (Stephen Voss trans., Hackett 1989) (1649).

⁶⁷ Keith Oatley, *Emotions and Human Flourishing*, 11 *Cognition & Emotion* 307 (1997).

⁶⁸ Aristotle, *The Politics of Aristotle* 146 (Ernest Baker trans. 1946).

⁶⁹ *Legally Blonde* (Metro-Goldwyn-Mayer 2001).

⁷⁰ HAL’s New Pals, *Economist*, June 28, 2001, at 77.

⁷¹ Dylan Evans, *Emotion: The Science of Sentiment* 31–32 (2001).

character from the *Star Trek: The Next Generation* television series and movies, the android Data.⁷² When Data obtains the ability to feel emotions, he malfunctions because of an inability to handle the volatility of those new emotions.⁷³

In contrast to the negative conception of emotions as impairing reasoning is the positive conception that emotions can sometimes help or improve reasoning and that combining emotions and reasoning is often better for decision making than relying on reasoning alone.⁷⁴ Some psychologists and philosophers have stressed the importance of emotions in ethical and moral decision making.⁷⁵ Recent work in marketing research considers the role that emotions play in consumer decision making.⁷⁶ A novel theory of affective intelligence about how emotions and rational calculations reinforce, interact with, and complement each other provides novel perspectives on such diverse political behavior as negative campaign advertisements, party identification, political judgment, and symbolic politics.⁷⁷ Much of this literature draws on research about brain physiology in neuroscience.⁷⁸

A version of a positive conception of emotions is the view that robots must possess emotions to manage conflicting goals. This viewpoint was expressed early on by a Nobel laureate in economics who is famous for his extensive work on bounded rationality.⁷⁹ Recent evidence suggests that emotions are crucial to many cognitive functions, including perception, learning, and rational decision making.⁸⁰ In particular, emotions can influence the

⁷² Richard Hanley, *Is Data Human? The Metaphysics of Star Trek* 5–10, 59, 105–12 (1998).

⁷³ *Star Trek: Generations* (Paramount Pictures 1994).

⁷⁴ Ronald de Sousa, *The Rationality of Emotion* (1987).

⁷⁵ Sidney Callahan, *In Good Conscience: Reason and Emotion in Moral Decision Making* (1991); Patricia S. Greenspan, *Emotions and Reasons: An Inquiry into Emotional Justification* (1989).

⁷⁶ Julie A. Edell & Marian Chapman Burke, *The Power of Feelings in Understanding Advertising Effects*, 14 *J. Consumer Res.* 421 (1987); Baba Shiv & Alexander Fedorikhin, *Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making*, 26 *J. Consumer Res.* 278 (1999); Patti A. Williams & Jennifer L. Aaker, *The Peaceful Co-existence of Conflicting Emotions: Examining Differential Responses to Mixed Emotional Appeals* (Stanford Grad. Sch. Bus. Res. Paper No. 1637, June 2000).

⁷⁷ George E. Marcus, W. Russell Neuman, & Michael MacKuen, *Affective Intelligence and Political Judgment* (2000).

⁷⁸ Antonio R. Damasio, *Descartes' Error: Emotion, Reason and the Human Brain* (1994); Antonio R. Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (1999); Joseph LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life* (1996); Edmund T. Rolls, *The Brain and Emotion* (1999).

⁷⁹ Herbert Simon, *Motivational and Emotional Controls of Cognition*, 74 *Psychol. Rev.* 29 (1967).

⁸⁰ Rosalind W. Picard, *Affective Computing* (1997); Norbert Schwarz, *Emotion, Cognition, and Decision Making*, 14 *Cognition & Emotion* 433 (2000); *Feeling and Thinking: The Role of Affect in Social Cognition* (Joseph P. Forgas ed. 2000).

content, intensity, and malleability of people's beliefs.⁸¹ Psychological game theory examines the inverse relationship, namely, how people's beliefs about strategic decisions can influence their emotions.

C. *Belief-Dependent Emotions*

Psychological game theory originated in the late 1980s to formally model emotions that depend on a player's beliefs about strategic decisions.⁸² Experimental evidence supports the hypothesis that for certain types of strategic interaction, beliefs about strategic behavior enter directly into some players' utility functions.⁸³ Applications of psychological game theory include models of fairness,⁸⁴ gift giving,⁸⁵ reciprocity,⁸⁶ and sequential reciprocity.⁸⁷ Legal applications of psychological game theory include models of litigation, social norms, securities resolution, commodification, and negotiations.⁸⁸ A possible application of psychological game theory is to model the practices of blaming and praising for economic policy.⁸⁹ The defining element of a psychological game is that at least one player's preferences depend on that player's beliefs about strategies. Because beliefs enter directly into some player's utility function, not only strategies but also beliefs over strategies are determined in equilibrium.

In particular, the definition of a psychological equilibrium combines the usual Nash equilibrium best-response property in strategies with a fulfilled or rational expectations property in beliefs over those strategies. In this sense, at least one player in a psychological game possesses endogenous preferences.

⁸¹ Emotions and Beliefs: How Feelings Influence Thoughts (Nico H. Frijda, Antony S. R. Manstead, & Sacha Bem eds. 2000).

⁸² John Geanakoplos *et al.*, Psychological Games and Sequential Rationality, 1 *Games & Econ. Behav.* 60 (1989); Van Kolpin, Equilibrium Refinement in Psychological Games, 4 *Games & Econ. Behav.* 218 (1992).

⁸³ Martin Dufwenberg, & Uri Gneezy, Measuring Beliefs in an Experimental Lost Wallet Game, 30 *Games & Econ. Behav.* 163 (2000).

⁸⁴ Matthew Rabin, Incorporating Fairness into Game Theory and Economics, 83 *Am. Econ. Rev.* 1281 (1993).

⁸⁵ Bradley J. Ruffle, Gift Giving with Emotions, 39 *J. Econ. Behav. & Org.* 399 (1999).

⁸⁶ Armin Falk & Urs Fischbacher, A Theory of Reciprocity (unpublished manuscript, February 1998) (<http://www.iew.unizh.ch/grp/fehr/wp-fehr.html>, visited August 9, 2001).

⁸⁷ Martin Dufwenberg, & Georg Kirchsteiger, A Theory of Sequential Reciprocity (unpublished manuscript, March 1998) (<http://greywww.kub.nl:2080/greyfiles/center/1998/doc/37.pdf>, visited August 9, 2001).

⁸⁸ Peter H. Huang, Trust, Guilt, and Securities Resolution, 151 *U. Pa. L. Rev.* (forthcoming 2003); Peter H. Huang, Reasons within Passions: Emotions and Intentions in Property Rights Bargaining, 79 *Or. L. Rev.* 435 (2000); Peter H. Huang, Dangers of Monetary Commensurability: A Psychological Game Model of Contagion, 146 *U. Pa. L. Rev.* 1701 (1998); Peter H. Huang & H.-M. Wu, More Order without More Law: A Theory of Social Norms and Organizational Cultures, 10 *J. L. Econ. & Org.* 390 (1994); Peter H. Huang & H.-M. Wu, Emotional Responses in Litigation, 12 *Int'l Rev. L. & Econ.* 31 (1992).

⁸⁹ Paul Anand, Blame, Game Theory and Economic Policy: The Cases of Health and Public Finance, 10 *J. Theoretical Pol.* 111, 121–22 (1998).

The precise functional form or nature of the dependence of preferences on beliefs about strategic behavior is fixed. But, at least one player in a psychological game has an equilibrium set of preferences because of that dependence and the requirement that equilibrium beliefs correspond to equilibrium behavior.

Psychological emotions involve changes in utilities, which depend on endogenously determined equilibrium beliefs about decisions. Emotions that are independent of players' beliefs about behavior or that depend on incorrect beliefs about behavior can be modeled as exogenous tastes. Emotions that are dependent on players' beliefs over choices are sensitive to equilibrium behavior if such expectations are required to correspond to actual decisions. People obviously feel both types of emotional responses to strategic behavior and outcomes. The category of exogenously given, fixed emotional payoffs does not capture the full spectrum of human emotional responses. After all, the capacity to experience feelings is not uniquely human because nonhuman life feels pain, anger, fear, and rage. But, humans have the additional capacity of self-awareness. Part of that self-awareness includes the ability to formulate beliefs and expectations over the actions chosen by other humans. Another part of that self-awareness involves the possibility of control over the self.

It is the juxtaposition of emotions and the potential for self-control that enables a human being to have a conscience, which can be defined as a self-conscious, psychological activity integrating thinking, feeling, and the willingness to act.⁹⁰ Psychological game theory enlarges the scope and domain of rationality by introducing beliefs over strategic behavior into utility functions. This allows for the analytical modeling of human conscience in decision making. People with a conscience are willing to do their part but are not willing to be "suckers." After all, humans are not saints, defined as beings that would cooperate or do what is right regardless of what others are expected to or actually do.

Recently, legal academics have suggested that preferences are not exogenous to, but instead can be influenced by, law. One view of criminal law is that it not only may provide deterrence in the form of penalties or fines but also can shape individual preferences.⁹¹ Another prominent legal scholar observed that private individual environmental preferences are contextual and depend endogenously on current environmental law and might be adaptive with respect to existing options and practices as well as past consumption.⁹²

Psychological game theory provides a formal analytical methodology that

⁹⁰ Callahan, *supra* note 75, at 14–28, provides such a definition of conscience.

⁹¹ Kenneth G. Dau-Schmidt, An Economic Analysis of the Criminal Law as a Preference-Shaping Policy, 1990 Duke L. J. 1 (1990).

⁹² Cass R. Sunstein, Endogenous Preferences, *Environmental Law*, 22 *J. Legal Stud.* 217 (1993); Cass R. Sunstein, How Law Constructs Preferences, 86 *Geo. L. J.* 2637 (1998).

captures the idea that law can influence preferences if it acts to change people's beliefs about strategic behavior. Law can alter people's beliefs about behavior either by selecting certain behavior as being legal and therefore focal or by expressing disapproval of certain behaviors as being illegal and hopefully stigmatized. The first role that law can play is thus as a coordination device or mechanism, choosing among multiple possible equilibrium outcomes. The second role that law may play is expressive or symbolic, indicating a public condemnation of certain types of behavior.

III. COMPLIANCE WITH INTERNATIONAL ENVIRONMENTAL LAW

Existing models of why actors comply with hard international environmental law focus on third-party intervention or mediation in some international environmental treaties or the self-enforcing nature of some international environmental agreements.⁹³ This section presents a different model of compliance with international environmental law, soft or hard, that is based on the motivation of not wanting to lose face in the international community. While people can obviously feel such motivations, one might ask whether nations or NGOs or groups have any face to lose. A response is that individual members of such groups can lose face. A related point is that leaders of groups can also lose face. Thus, many commentators have stated that because the world will be watching when the People's Republic of China hosts the Olympics in 2008, the Chinese government may be motivated to engage in a more humane human rights policy. Similarly, many Europeans and Americans are critical of the United States for not ratifying the 1997 Kyoto Protocol to curb greenhouse gas emissions.⁹⁴

The question of why people comply with the law in general has been investigated from various perspectives. There is the neoclassical economic model of criminal deterrence put forth by the Nobel laureate Gary Becker.⁹⁵ More recently, Tom Tyler and Gregory Mitchell have provided explanations for legal compliance that is due to perceived legitimacy of the law.⁹⁶ Margaret Levi introduced the idea of quasi-voluntary compliance by a state's citizenry

⁹³ Scott Barrett, *Self-Enforcing International Environmental Agreements*, 46 *Oxford Econ. Papers* 878 (1994).

⁹⁴ Adam Clymer, *Survey Finds European Public Critical of Bush Foreign Policies*, *N.Y. Times*, August 16, 2001, at A16.

⁹⁵ Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 *J. Pol. Econ.* 169 (1968).

⁹⁶ Tom R. Tyler, *Why People Obey the Law* 30–39 (1990); Tom R. Tyler & Gregory Mitchell, *Legitimacy and the Empowerment of Discretionary Legal Authority: The United States Supreme Court and Abortion Rights*, 43 *Duke L. J.* 703, 783–84 (1994); Tom R. Tyler, *Compliance with Intellectual Property Laws: A Psychological Perspective*, 29 *N.Y.U. J. Int'l L. & Pol.* 219, 229–30 (1996–97); Tom R. Tyler, *Procedural Fairness and Compliance with the Law*, 133 *Swiss J. Econ. & Stat.* 219, 224–25 (1997).

regarding taxation.⁹⁷ Levi applied that idea to model contingent consent to military service by the citizens of a state.⁹⁸ The fundamental insight of quasi-voluntary compliance is that for an authority to be effective—whether that authority be a monarch, democratic government, or impersonal set of laws—compliance with that authority cannot ultimately rest solely on enforcement by external sanctions. The threat of punishment, be it a monetary fine or imprisonment or worse, is costly to carry out and becomes costlier as people do not believe they should comply. The looting and rioting in south central Los Angeles that followed the Rodney King trial verdict is a vivid example and reminder that external control mechanisms are often ineffective once individuals believe that authority has lost its legitimacy. Credible threats and the act of punishment itself provide only a partial explanation of why people do not violate laws. As is well known in the law and economics literature, enforcement of laws is costly, and, moreover, there is the problem of who is to enforce the enforcers.

As the Nobel laureate Kenneth Arrow once stated, in the final analysis, authority is obeyed when “it is the focus of convergent expectations . . . that others will obey it.”⁹⁹ Individuals comply because they expect others to also comply. This explains the importance of authority being visible in coordinating the expectations of individuals. In the language of game theory, authority serves to select a focal point from among multiple Nash equilibria. As Arrow pointed out, external symbols of authority function as reminders and signals that others are believed to also respect authority. Indeed, Arrow reminded us that, despite his madness, King Lear was able to see clearly that “a dog’s obeyed in office.”¹⁰⁰ Arrow observed that convergent expectations being the source of authority implies that authority has a fragile nature.

An authority can either be visible to and respected by others—that is, the authority possesses a high degree of legitimacy—or visible to and feared by others—that is, the authority can be illegitimate but has the support of the military or some other coercive force. Contingent consent with a legitimate authority continues as long as the authority is responsible by not abusing its power so others are willing to obey that authority. This view of authority explains why the more legitimate an authority is (perceived to be), the fewer external sanctions are required for compliance, and the less legitimate an authority is (perceived to be), the more external sanctions are required to force compliance. It also makes clear the conditional and delicate nature of authority. The ancient Chinese viewed their emperors as having a mandate

⁹⁷ Margaret Levi, *Of Rule and Revenue* (1988).

⁹⁸ Margaret Levi, *Consent, Dissent, and Patriotism* (1997).

⁹⁹ Kenneth J. Arrow, *The Limits of Organization* 72 (1974).

¹⁰⁰ William Shakespeare, *King Lear*, act 4, sc. 6, line 164 (Complete Works, Oxford Univ. Press 1943), quoted in *id.* at 73.

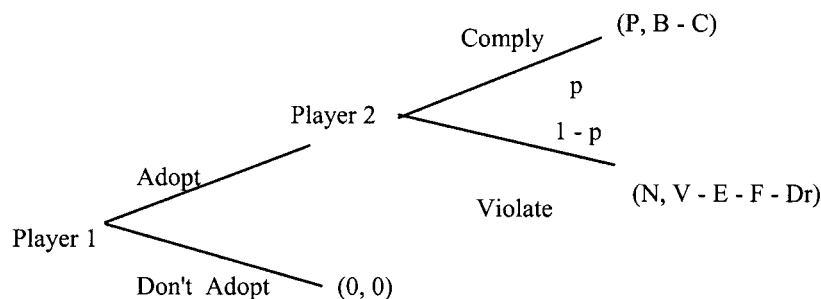


FIGURE 1.—A psychological emotional compliance game; r is player 2's expectation of player 1's expectation of p .

from heaven to rule that remained in force as long as the rulers acted in harmony with nature and society.

Consider the highly stylized two-player sequential game of compliance depicted in Figure 1. Player 1 has a choice between maintaining the status quo or adopting some international environmental law in the form of a particular accord, convention, protocol, resolution, or treaty. Player 2 chooses to comply with or violate the international environmental law in question if the first party adopts it. The first actor in this game could be a state, an NGO, an international organ, the United Nations, or a group of states, such as the European Union. In more realistic versions of this basic game, there are multiple actors that move first, including player 2 itself. The second actor in this game might not be a state, an NGO, or some other collection of individuals. It might instead be an elected official, a manager, a political leader, a regulator, or an organizational leader. All that matters is the second actor cares about what other actors think of its behavior. For example, "people may be willing to stop using products that are seen as environmentally harmful (such as cosmetics made from whales or hair spray containing chlorofluorocarbons) because there is social stigma attached to their use."¹⁰¹

The payoffs to both players are normalized to zero if the status quo results. The payoffs if player 1 adopts and player 2 complies are $P > 0$ for player 1 and $B - C$ to player 2. Player 1 is thus better off if player 2 complies as compared with the status quo. The variable B denotes the positive benefits to player 2 of compliance, while C represents the positive costs to player 2 of compliance. The variable V represents the benefits to player 2 of violation, E represents the expected fine, harm, or sanction to player 2 of violation, and L represents the loss in face to player 2 of violation. The payoffs if

¹⁰¹ Paul M. Brown & Steven Stewart, Avoiding Severe Environmental Consequences: Evidence on the Role of Loss Avoidance and Risk Attitudes, 38 *J. Econ. Behav. & Org.* 179, 190 (1999).

player 1 adopts and player 2 violates are $N < 0$ for player 1 and $V - E - L$ to player 2. Player 1 is thus worse off if player 2 does not comply as compared with the status quo. A standard neoclassical model of compliance would set L equal to 0. In that case, perfect deterrence is achieved if E is chosen, so $B - C > V - E$. Usually E is further split up into two terms: the probability of enforcement and the magnitude of the fine, penalty, or sanction. Assuming that potential violators are risk neutral, all that matters is E , not its variance. Then, if raising the probability of enforcement is costly, it is cheaper to raise the size of the fine, subject to bankruptcy or boundary constraints.¹⁰² Suppose that $L > 0$ but is exogenous. If $B - C > V - E - L$, there is no deterrence. If $B - C < V - E - L$, there is perfect deterrence, and it can be achieved with a lower expected penalty than when $L = 0$. Finally, if $B - C = V - E - L$, potential violators are just indifferent between complying or not.

But an exogenous L begs the question of where does the loss of face that player 2 feels come from and what determines the magnitude of that loss. Players may vary in their exogenous propensities to experience loss of face on the basis of such demographic variables as their age, culture, ethnicity, gender, and upbringing, as well as other unobservable differences. A desire to avoid the loss of face can be particularly strong among Asian decision makers.¹⁰³ It is also unclear whether players feel a loss of face from getting caught for violating the law or for morally disappointing the rest of the international community. The first sort of emotion is an instrumental one, while the second type of emotion is an intrinsic or ethical one. Both types of emotion can be captured in the game by dividing L into two further terms. The first is a term F that is fixed or independent of any player's beliefs about behavior. The second is a term capturing the moral disappointment component of losing face. It captures the letting down the international community aspect of losing face because it depends on the beliefs this player has about the rest of the international community's beliefs concerning this player's behavior.

Let p denote the probability that player 2 complies with the international environmental law. Let q denote player 1's expectation of the variable p . In other words, q is the mean of player 1's subjective probability distribution over the variable p . Let r denote player 2's expectation of q . In other words, r is the mean of player 2's subjective probability distribution over the variable q . The variable r is what is known as a second-order expectation, while the variable q is what is known as a first-order expectation.¹⁰⁴ For the sake of simplicity, assume that the psychological component of losing face depends

¹⁰² Gary S. Becker & George J. Stigler, *Law Enforcement, Malfeasance, and Compensation of Enforcers*, 3 *J. Legal Stud.* 1 (1974).

¹⁰³ Michael Harris Bond & Kwang-kuo Hwang, *The Social Psychology of the Chinese People*, in *The Psychology of the Chinese People* 213, 243–49 (Michael Harris Bond ed. 1986).

¹⁰⁴ See Geanakoplos *et al.*, *supra* note 82, for a discussion of higher-order expectations.

linearly on r , namely, player 2's expectations of player 1's expectations of the probability that player 2 will comply with the international environmental law. In other words, suppose that the psychological component of losing face is Dr , where D is a disappointment factor with $D > 0$. The linearity assumption is for analytical simplicity. The assumption that player 2's loss of face from violating the international environmental law depends on the size of r captures the idea that losing face includes a psychological component. Thus, the magnitude of the loss in face player 2 experiences from not complying with some international environmental law is provided by $L = F + Dr$.

In order to fulfill the condition of rational expectations required by the definition of a psychological equilibrium, it must be the case that $p = q = r$ in equilibrium. There are three psychological equilibrium outcomes. The first equilibrium involves player 1 adopting the international environmental law and $p = q = r = 1$, or player 2 choosing with probability 1 to comply with the international environmental law. The associated payoffs are $(P, B - C)$. A second equilibrium involves player 1 not adopting the international environmental law and $p = q = r = 0$, or player 2 choosing with probability zero to comply with the international environmental law if it were to be adopted by player 1. The associated payoffs are $(0, 0)$. The third equilibrium has player 1 adopting the international environmental law and $p^* = q^* = r^* = (V - E - F + C - B)/D$, or player 2 choosing to comply with the international environmental law with probability p^* . This third equilibrium exists only if the parameters satisfy the condition $0 < V - E - F + C - B < D$.¹⁰⁵ The associated payoffs are $(p^*P + (1 - p^*)N, B - C)$. The third and only completely mixed strategy equilibrium is found by setting player 2's payoffs from complying and from violating the international environmental law equal: $B - C = V - E - F - Dr$ and setting $p = r$.

In the first equilibrium, player 1 adopts the international environmental law, and player 2 complies with it because player 2 expects that the international community expects that player 2 will comply with the international environmental law. If player 2 were to violate the international environmental law, player 2 loses face to such a degree that player 2 would rather comply. In the second equilibrium, player 1 does not adopt the international environmental law, and, had player 1 adopted the international environmental law, player 2 would break the international environmental law because of player 2's expectations that player 1 expects the international environmental law to be broken. In the second equilibrium, breaking the international environmental law causes player 2 to lose face, but only to such a small degree that breaking it dominates compliance with it. In the third equilibrium, player 1 adopts the international environmental law despite the fact that player 2 will break it some proportion of the time because that still makes player 1

¹⁰⁵ These conditions ensure that $0 < p^* < 1$.

strictly better off than not adopting the international environmental law. Player 2 is just indifferent between complying with and breaking the international environmental law. The abstract formulation of this compliance game means that it applies generally. Which of the above psychological equilibria obtains depends on the magnitude of the costs and benefits of compliance, both economic and psychological, just as differences in the underlying economics of addressing ozone depletion versus climate change imply differences between the Kyoto Protocol and the Montreal Protocol.¹⁰⁶

One can think of the above three different equilibrium beliefs as reflecting how strong a moral duty of compliance there is toward this particular international environmental law. Equilibrium 1 occurs when the moral duty of compliance is strongest. Equilibrium 2 occurs if the moral duty of compliance is weakest (namely, nonexistent). Equilibrium 3 occurs if the moral duty of compliance is intermediate in strength. In contrast to a unique equilibrium for a game of compliance without psychological payoffs (when $L = 0$), the presence of psychological loss of face makes possible multiple equilibrium outcomes, in particular, the first and third equilibrium outcomes. In these two equilibrium outcomes, the corresponding equilibrium expectations and psychological emotional payoffs are what support increased compliance as compared to when $L = 0$. The lesson of this model is that international environmental law can involve a perceived moral duty of compliance and, in doing so, change endogenously both expectations of potential violators and of the international community about behavior and that behavior itself. Such expectations can become self-enforcing should actors have the sort of preferences described above.

An empirical question is whether international actors have the above sort of belief-dependent preferences. The concept of and concern over face is universal.¹⁰⁷ A sociological definition of face is “the positive social value a person effectively claims for himself by the line others assume he has taken during a particular social contact. Face is an image of self that is delineated in terms of approved social attributes.”¹⁰⁸ There is evidence that a desire to avoid the loss of face motivates countries in the context of international negotiations. For example, during the Military Armistice and Political Talks at Panmunjon, Korea, in 1952 concerning prisoners of war, because China was “[u]nable to accept the ‘loss of face,’ disturbed by the ‘inequality of the US position,’ and recognizing the propaganda leverage they possessed given the focus in the United States on the worth of the individual, the Chinese felt compelled to use as many ways as possible to convince the world of the

¹⁰⁶ Scott Barrett, *Montreal versus Kyoto: International Cooperation and the Global Environment*, in *Global Public Goods: International Cooperation in the Twenty-First Century* 192 (Inge Kaul, Isabelle Grunberg, & Marc A. Stern eds. 1999).

¹⁰⁷ David Yau-fai Ho, *On the Concept of Face*, 81 *Am. J. Soc.* 867, 881–82 (1976).

¹⁰⁸ Erving Goffman, *On Face-Work: An Analysis of Ritual Elements in Social Interaction*, 18 *Psychiatry* 213 (1955).

correctness of their position and to persuade the United States to change its policies."¹⁰⁹ The language of international environmental law itself often suggests that international environmental law is trying to create such preferences if they do not already exist. Notice that what is important is that not only do actors experience loss of face from breaking international environmental laws but also that loss of face is sufficiently dependent on their expectation about how strong that moral duty of compliance is perceived to be by the international community. In terms of the formal model, the variable q captures the international community's expectations regarding the strength of the moral duty of compliance, and the variable r captures potential violators' expectations of the international community's expectations about the strength of the moral duty of compliance.

This model suggests the importance of a policy of monitoring and publicizing violations of international environmental law. Such an informational policy of disclosing international environmental violations will be more cost effective than expenditures on greater enforcement because of the high costs of greater enforcement compared to disclosing violations. Successful enforcement requires not only detection but also prosecution and the imposition of sanctions that might be costly to impose. A policy of credible publicity requires only detection and verification. Indeed, this model explains why soft international environmental law or law that is not binding and therefore nonenforceable can matter. It explains why actors care about soft international environmental law. It also suggests that a method for player 1 to increase the likelihood of player 2's complying is for player 1 not only to publicize violations but also to publicize that player 1 expects that player 2 is not going to commit any violations. Player 1's making such expectations public may push up the values of r and thus p . This analysis means that pessimistic editorials and speeches by other countries stating that the United States is now going to break all of its international environmental commitments will actually be counterproductive because the United States's expectation of what others expect it will do in terms of international environmental issues is then lowered.

IV. EXTENSIONS OF THE BASIC MODEL

The above psychological game-theoretic model can be generalized in several directions. First, the model can be modified from one about international actors motivated by a desire to avoid losing face in the international community to one about international actors motivated by a desire to gain the approval of the international community. In other words, instead of subtracting a disappointment term Dr that captures the psychological cost of violating

¹⁰⁹ Alfred D. Wilhelm, Jr., *The Chinese at the Negotiating Table: Style and Characteristics* 143 (1994).

international environmental law from actors' payoffs, actors may add such a positive approval term Ar that captures the psychological benefit of complying with international environmental law. The algebra of the model is invariant with respect to such an alteration of the model.

More interesting, the model can be reinterpreted to analyze the situation in which international actors who do not comply with an international agreement suffer punishments or economic sanctions that are more severe the fewer the parties who are expected to not, and do not, comply with the international agreement. Such a pattern of punishment could occur if detecting and documenting international agreement violations is costly, so a general pattern of expected and actual compliance in the international community implies that violations are more readily uncovered and proved. In Figure 1, the term Dr can be reinterpreted to capture any punishments or economic sanctions that are more severe when there are fewer expected and actual violations. This is because in the representative agent framework of the model in Section III, fewer expected violations translate into a higher level of q , that is, a higher expectation by the international community that any potential international environmental law violator will comply. A higher level of q implies a higher level of r , that is, a higher expectation by any potential international environmental law violator that the international community expects any potential international environmental law violator to comply. Finally, a higher level of r means a more severe punishment Dr , where $D > 0$. The rest of the analysis of the model proceeds as before in Section III, and once again, there are parameter configurations under which there are multiple equilibria.

In addition, the model in Section III can be generalized to include actors with heterogeneous preferences. In the basic model, all of the actors have the same psychological preferences. But what if some actors perversely enjoy violating international environmental law and receive greater enjoyment the more they think that the international community expects them to comply with international environmental law? Clearly, highly publicizing the violations of such actors would have precisely the opposite result as in the basic model.

Indeed, the mere adoption of an international environmental law may provoke such actors to behave so as to violate it. An example of a related phenomenon is provided by the recent proliferation of signs in many hotels that ask patrons to help conserve environmental resources by reusing towels and placing on the floor only towels that guests desire to be changed. One colleague's reaction, according to him, is to throw all his room's towels on the floor to spite the hotel for expecting their appeal to his environmental conscience to be successful.

A related phenomenon is provided by the signs in restaurant bathrooms stating that it is not only good hygiene but also the law that employees wash their hands before they return to their jobs. Again, most restaurant employees

probably do wash their hands before they return to their jobs from habit, because it is the healthy thing to do, or because it is the law. But one can easily imagine some individual who would have washed his hands for the first or second reason but, on seeing the sign, purposely choosing to not do so because of the last reason. Such rebellion at authority might especially be true of adolescent employees.

To the degree that such actors exist, adopting international environmental law and publicizing violations can result in both greater and less compliance on the part of different actors. It is ultimately an empirical question as to how many actors have which type of preferences. How legal and moral incentives interact depends on the answer to such a question. Legal duties might be a complement or substitute for moral ones. In other words, law could supplement or crowd out moral or nonmaterial incentives. The nature of the relationship between legal and moral incentives is complicated and is akin to how values and interests interact in international legalization.¹¹⁰

A dynamic extension of the basic model could include the possibility that actors have metapreferences over their preferences. If psychological emotional preferences are malleable over time, then international environmental law might help actors develop the sorts of preferences that result in greater compliance with international environmental laws that actors feel strongly about morally. Thus, soft international environmental law not only might be a prelude to future hard international environmental law but also might foster the development of certain belief-dependent emotional responses. Thus, actors might care about soft international environmental law because it can alter preferences and resulting behavior. The mere adoption of international environmental law may lead some actors to comply with it provided they believe that the international community will perceive violating it to be morally wrong. Of course, for actors to believe that such perceptions will occur in the international community requires that there be some high degree of consensus in the international community regarding the moral or ethical nature of that international environmental law.

V. CONCLUSIONS

This paper has presented a simple psychological game-theoretic model explaining compliance with international environmental law. Actors are motivated by not only financial or material considerations but also emotional and psychological costs and benefits. Actors care about what others think of them. In doing so, the actors in this paper exhibit emotional rational choice. Their emotions are in part responses to being embedded in an inherently social universe, that of the international community. This model predicts

¹¹⁰ Kenneth W. Abbott & Duncan Snidal, Values and Interests: International Legalization in the Fight against Corruption, in this issue, at S141.

greater compliance with those international environmental laws for which there is widespread moral or ethical support in the international community.

While several extensions of the basic model were discussed, all of them involve actors having rational expectations about strategic behavior. But actors may not be able to form or learn such rational expectations.¹¹¹ In that case, actors can still behave rationally, just without rational beliefs.¹¹² Another possibility is that actors have rational beliefs but still do not behave optimally given those beliefs.¹¹³

The approach in this paper focused on how actors can be motivated to act in the present by correctly anticipating emotions in the future. Related but distinct emotions are those that actors experience in the present about past or future decisions. All of us have at one time or another experienced such anticipatory emotions as anxiousness, fear, hope, and suspense. Recent economic research extends the neoclassical model of expected utility to a psychological expected utility model that incorporates anticipatory feelings prior to the resolution of risk.¹¹⁴ The authors of that general model investigate the consequences on asset pricing of incorporating a particular anticipatory emotion into portfolio choice, namely, anxiety.¹¹⁵ They also discuss the policy implications of anxiety for the Federal Reserve's disclosing information regarding the imminent failure of a large bank.¹¹⁶ In another model, they ask if, when, and to what extent a doctor should provide medical information to patients who might be averse to such information or might be anxious over being ignorant.¹¹⁷ Finally, they discuss challenges to learning resulting from anxiety concerns in the context of financial education and genetic testing.¹¹⁸ It would be interesting to consider the policy implications of anxiety for international environmental law.

Anticipatory emotions are related to a novel theory about decision making under conditions of risk, namely, the risk-as-feelings hypothesis.¹¹⁹ This al-

¹¹¹ Consider the difficulty that Bill Murray's character had learning about Andie MacDowell's character in the movie *Groundhog Day* (Columbia Pictures Corp., 1993), which was a stationary environment.

¹¹² George A. Akerlof, *The Economics of Illusion*, 1 *Econ. & Pol.* 1 (1989).

¹¹³ Gur Huberman & Ariel Rubinstein, *Correct Belief, Wrong Action and a Puzzling Gender Difference* (unpublished manuscript, September 2000) (<http://www.princeton.edu/~ariel/vitae.html>, visited August 10, 2001).

¹¹⁴ Andrew Caplin & John Leahy, *Psychological Expected Utility Theory and Anticipatory Feelings*, 116 *Q. J. Econ.* 55 (2001).

¹¹⁵ *Id.* at 66–69.

¹¹⁶ *Id.* at 76–77.

¹¹⁷ Andrew Caplin & John Leahy, *The Supply of Information by a Concerned Expert* (New York Univ. Starr Ctr. Applied Econ. Working Paper 99–08, August 1999) (<http://www.econ.nyu.edu/user/caplina/research.htm>, visited August 10, 2001).

¹¹⁸ Andrew Caplin & John Leahy, *Behavioral Policy*, in *Economics and Psychology* (Isabelle Brocas & Jean D. Carrillo eds., forthcoming 2002).

¹¹⁹ George F. Loewenstein *et al.*, *Risk as Feelings*, 127 *Psychol. Bull.* 267 (2001).

ternative to cognitive and consequentialist theories also focuses on emotions that decision makers experience leading up to and including the moment of decision making. The theory is based on extensive research in clinical, cognitive, physiological, and social psychology that demonstrates that not only do cognitive assessments of and emotional reactions to risky settings differ but also that such emotional reactions often motivate behavior. The risk-as-feelings hypothesis implies rethinking such core notions of securities regulation as materiality, the reasonable investor, and mandatory disclosure.¹²⁰

The presence of anticipatory emotions can result in a decision maker's preferences being inconsistent over time.¹²¹ Such lack of intertemporal consistency might not be surprising.¹²² But it raises complex normative questions about how to assess individual welfare. For example, how should the possibly different preferences of multiple time slices of individuals be aggregated? A distinct but similar issue arises on realizing that decision makers discount not only the future but also the past.¹²³ Such retrospective time inconsistency occurs because of decaying and imperfect memory. Psychological experiments document systematic errors in remembered as opposed to experienced utilities.¹²⁴ The impacts of anticipatory emotions on people's views about international environmental issues, as well as how the law can and should address these impacts, must wait for another day.

¹²⁰ Peter H. Huang, *Regulating Financial Anxiety and Excitement: Affective Investing and Effective Securities Regulation* (unpublished manuscript on file with author, June 2002).

¹²¹ Caplin & Leahy, *supra* note 114, at 55, 65.

¹²² Herbert Gintis, *Game Theory Evolving: A Problem-Centered Introduction to Modeling Strategic Behavior* 245–46 (2000).

¹²³ Andrew Caplin & John Leahy, *The Social Discount Rate* (Nat'l Bureau Econ. Res. Working Paper 7983, October 2000) (<http://www.econ.nyu.edu/user/caplina/research.htm>, visited August 10, 2001).

¹²⁴ Daniel Kahneman, Peter P. Wakker, & Rakesh Sarin, *Back to Bentham? Explorations of Experienced Utility*, 112 *Q. J. Econ.* 375, 381–88 (1997).